भारतीय मानक
Indian Standard

IS 6455 : 2020

एकल पंक्ति गहरे खांचे वाली बॉल बियरिंग — विशिष्टि

(पहला पुनरीक्षण)

Single Row Deep Groove Ball Bearings — Specification

(First Revision)

ICS 21.100.20

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली – 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.gov.in www.standardsbis.in

December 2020 **Price Group 7**

Bearings Sectional Committee, PGD 13

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft was finalized by the Bearings Sectional Committee and had been approved by the Production and General Engineering Division Council.

This standard was first published in 1972. This revision has been taken up to incorporate feedback gained through experience and other developments taken at international level in this field.

In this revision, the following changes have been made:

a) Clauses on terminology, material specification, and hardness have been added;
b) Clauses on dimensions, tolerances and designation have been modified;
c) Figure 1 and Figure 2 have been added; and
d) Table 1 and Table 2 have been added.

In the formulation of this standard, considerable assistance has been derived from DIN 625-1 : 2011 ‘Rolling Bearings — Radial deep groove ball bearings — Part 1: Single Row’ issued by the Deutsches Institut Für Normung (DIN).

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SINGLE ROW DEEP GROOVE BALL BEARINGS — SPECIFICATION

(First Revision)

1 SCOPE

This standard specifies requirements for single row deep groove ball bearings and their components including through hardened, induction hardened and cased hardened bearings.

This standard does not cover requirements of airframe bearings and instrument precision bearings.

2 REFERENCES

The standards given below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standard indicated below:

IS No.	*Title*
513 (Part 1) : 2016	Cold reduced carbon steel sheet and strip: Part 1 Cold forming and drawing purpose (*sixth revision*)
2399 : 2019	Rolling bearings — Vocabulary (*second revision*)
2898 (Part 1) : 2019	Rolling bearings — Balls: Part 1 Steel balls (*second revision*)
2898 (Part 2) : 2019	Rolling bearings — Balls: Part 2 Ceramic balls
3073 : 1967	Assessment of surface roughness
3823 : 2014	Rolling bearings — Static load ratings (*third revision*)
3824 : 2014	Rolling bearings — Dynamic load ratings and rating life (*third revision*)
4397 : 1999	Cold-rolled carbon steel strips for ball and roller bearing cages/retainers (*second revision*)
4398 : 1994	Carbon-chromium steel for the manufacture of balls, rollers and bearing races (*second revision*)
4905 : 2015	Random sampling and randomization procedures (*first revision*)
5489 : 1975	Specification for carburizing steels for use in bearing industry (*first revision*)
5692 : 2019	Rolling bearings — Radial bearings — Geometrical product specifications (GPS) and tolerance values (*second revision*)
5935 (Part 1) : 2019	Rolling bearings — Internal clearance: Part 1 Radial internal clearance for radial bearings (*second revision*)
13406 : 2018	Rolling bearings — Radial ball bearings with flanged outer ring — Flange dimensions
17111 : 2019	Heat-treated steels, alloy steels and free-cutting steels — Ball and roller bearing steels

3 TERMS AND DEFINITIONS

For the purpose of this standard the terms and definitions given in IS 2399 and the following shall apply.

3.1 Supplier — The party supplying the bearings.

3.2 Purchaser — The party purchasing the bearings. This term shall also apply to person or persons expressly authorized by the purchaser to act on his behalf for inspection of the material.

4 DIMENSION AND DESIGNATIONS

4.1 Radial Ball Bearings with Flanged Outer Ring

For deep groove ball bearing with flange outer ring the dimensions given in IS 13406 shall apply.

4.2 Radial Ball Bearings

4.2.1 Boundary dimensions and designation of Deep groove ball bearing shall be as per Table 1, Fig. 1 and Fig. 2.

4.2.2 For Z-groove seal/shield dimension shall be as agreed between the supplier and the purchaser.

Table 1 Dimension and Designation

(*Clause* 4.2.1)

All dimensions in millimetres

d	D	B	$r1_s$, $r2_s$ *Min*	Designation[1)]						
				Basic type	Variant					
					Z	2Z	RS	2RS	N	NR
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
3	10	4	0.15	623	623-Z	623-2Z	623-RS	623-2RS	–	–
4	9	2.5	0.1	618/4	–	–	–	–	–	–
	9	4	0.1	–	638/4-Z	638/4-2Z	–	–	–	–
	11	4	0.15	619/4	619/4-Z	619/4-2Z	–	–	–	–
	13	5	0.2	624	624-Z	624-2Z	–	–	–	–
	16	5	0.3	634	634-Z	634-2Z	634-RS	634-2RS	–	–
5	11	3	0.15	618/5	–	–	–	–	–	–
	11	5	0.15	–	638/5-Z	638/5-2Z	–	–	–	–
	13	4	0.2	619/5	619/5-Z	619/5-2Z	–	–	–	–
	16	5	0.3	625	625-Z	625-2Z	–	–	–	–
	19	6	0.3	635	635-Z	635-2Z	635-RS	635-2RS	–	–
6	13	3.5	0.15	618/6	–	–	–	–	–	–
	13	5	0.15	–	628/6-Z	628/6-2Z	–	–	–	–
	15	5	0.2	619/6	619/6-Z	619/6-2Z	–	–	–	–
	19	6	0.3	626	626-Z	626-2Z	626-RS	626-2RS	–	–
7	14	3.5	0.15	618/7	–	–	–	–	–	–
	14	5	0.15	–	628/7-Z	628/7-2Z	–	–	–	–
	17	5	0.3	619/7	619/7-Z	619/7-2Z	–	–	–	–
	19	6	0.3	607	607-Z	607-2Z	607-RS	607-2RS	–	–
	22	7	0.3	627	627-Z	627-2Z	627-RS	627-2RS	–	–
8	16	4	0.2	618/8	—	—	–	–	–	–
	16	6	0.2	–	638/8-Z	638/8-2Z	–	–	–	–
	19	6	0.3	619/8	619/8-Z	619/8-2Z	–	–	–	–
	22	7	0.3	608	608-Z	608-2Z	608-RS	608-2RS	–	–
9	17	4	0.2	618/9	–	–	–	–	–	–
	17	6	0.2	–	638/9-Z	638/9-2Z	–	–	–	–
	20	6	0.3	619/9	619/9-Z	619/9-2Z	–	–	–	–
	24	7	0.3	609	609-Z	609-2Z	609-RS	609-2RS	–	–
	26	8	0.3	629	629-Z	629-2Z	629-RS	629-2RS	–	–
10	19	5	0.3	61800	61800-Z	61800-2Z	61800-RS	61800-2RS	–	–
	19	7	0.3	–	63800-Z	63800-2Z	–	–	–	–
	22	6	0.3	61900	61900-Z	61900-2Z	–	–	–	–
	26	8	0.3	6000	6000-Z	6000-2Z	6000-RS	6000-2RS	–	–
	30	9	0.6	6200	6200-Z	6200-2Z	6200-RS	6200-2RS	6200-N	6200-NR
	35	11	0.6	6300	6300-Z	6300-2Z	6300-RS	6300-2RS	–	–

Table 1 (*Continued*)

d	D	B	$r1_s$, $r2_s$ *Min*	Designation[1)]						
				Basic type	Variant					
					Z	2Z	RS	2RS	N	NR
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
12	21	5	0.3	61801	61801-Z	61801-2Z	61801-RS	61801-2RS	–	–
	28	8	0.3	6001	6001-Z	6001-2Z	6001-RS	6001-2RS	–	–
	32	10	0.6	6201	6201-Z	6201-2Z	6201-RS	6201-2RS	6201-N	6201-NR
	37	12	1	6301	6301-Z	6301-2Z	6301-RS	6301-2RS	6301-N	6301-NR
15	24	5	0.3	61802	61802-Z	61802-2Z	61802-RS	61802-2RS	–	–
	32	8	0.3	16002	16002-Z	16002-2Z	16002-RS	16002-2RS	–	–
	32	9	0.3	6002	6002-Z	6002-2Z	6002-RS	6002-2RS	–	–
	35	11	0.6	6202	6202-Z	6202-2Z	6202-RS	6202-2RS	6202-N	6202-NR
	42	13	1	6302	6302-Z	6302-2Z	6302-RS	6302-2RS	6302-N	6302-NR
17	26	5	0.3	61803	61803-Z	61803-2Z	61803-RS	61803-2RS	–	–
	35	8	0.3	16003	16003-Z	16003-2Z	16003-RS	16003-2RS	–	–
	35	10	0.3	6003	6003-Z	6003-2Z	6003-RS	6003-2RS	6003-N	6003-NR
	40	12	0.6	6203	6203-Z	6203-2Z	6203-RS	6203-2RS	6203-N	6203-NR
	47	14	1	6303	6303-Z	6303-2Z	6303-RS	6303-2RS	6303-N	6303-NR
	62	17	1.1	6403	6403-Z	6403-2Z	6403-RS	6403-2RS	–	–
20	32	7	0.3	61804	–	–	61804-RS	61804-2RS	–	–
	42	8	0.3	16004	16004-Z	16004-2Z	16004-RS	16004-2RS	–	–
	42	12	0.6	6004	6004-Z	6004-2Z	6004-RS	6004-2RS	6004-N	6004-NR
	47	14	1	6204	6204-Z	6204-2Z	6204-RS	6204-2RS	6204-N	6204-NR
	52	15	1.1	6304	6304-Z	6304-2Z	6304-RS	6304-2RS	6304-N	6304-NR
	72	19	1.1	6404	6404-Z	6404-2Z	6404-RS	6404-2RS	–	–
25	37	7	0.3	61805	–	–	61805-RS	61805-2RS	–	–
	47	8	0.3	16005	16005-Z	16005-2Z	16005-RS	16005-2RS	–	–
	47	12	0.6	6005	6005-Z	6005-2Z	6005-RS	6005-2RS	6005-N	6005-NR
	52	15	1	6205	6205-Z	6205-2Z	6205-RS	6205-2RS	6205-N	6205-NR
	62	17	1.1	6305	6305-Z	6305-2Z	6305-RS	6305-2RS	6305-N	6305-NR
	80	21	1.5	6405	6405-Z	6405-2Z	6405-RS	6405-2RS	–	–
30	42	7	0.3	61806	–	–	61806-RS	61806-2RS	–	–
	55	9	0.3	16006	16006-Z	16006-2Z	16006-RS	16006-2RS	–	–
	55	13	1	6006	6006-Z	6006-2Z	6006-RS	6006-2RS	6006-N	6006-NR
	62	16	1	6206	6206-Z	6206-2Z	6206-RS	6206-2RS	6206-N	6206-NR
	72	19	1.1	6306	6306-Z	6306-2Z	6306-RS	6306-2RS	6306-N	6306-NR
	90	23	1.5	6406	6406-Z	6406-2Z	6406-RS	6406-2RS	–	–
35	47	7	0.3	61807	–	–	61807-RS	61807-2RS	–	–
	62	9	0.3	16007	16007-Z	16007-2Z	16007-RS	16007-2RS	–	–
	62	14	1	6007	6007-Z	6007-2Z	6007-RS	6007-2RS	6007-N	6007-NR
	72	17	1.1	6207	6207-Z	6207-2Z	6207-RS	6207-2RS	6207-N	6207-NR
	80	21	1.5	6307	6307-Z	6307-2Z	6307-RS	6307-2RS	6307-N	6307-NR
	100	25	1.5	6407	6407-Z	6407-2Z	6407-RS	6407-2RS	6407-N	6407-NR

Table 1 (*Continued*)

d	D	B	$r1_s$, $r2_s$ *Min*	Designation[1)]						
				Basic type	Variant					
					Z	2Z	RS	2RS	N	NR
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
40	52	7	0.3	61808	–	–	61808-RS	61808-2RS	–	–
	68	9	0.3	16008	16008-Z	16008-2Z	16008-RS	16008-2RS	–	–
	68	15	1	6008	6008-Z	6008-2Z	6008-RS	6008-2RS	6008-N	6008-NR
	80	18	1.1	6208	6208-Z	6208-2Z	6208-RS	6208-2RS	6208-N	6208-NR
	90	23	1.5	6308	6308-Z	6308-2Z	6308-RS	6308-2RS	6308-N	6308-NR
	110	27	2	6408	6408-Z	6408-2Z	6408-RS	6408-2RS	6408-N	6408-NR
45	58	7	0.3	61809	–	–	61809-RS	61809-2RS	–	–
	75	10	0.6	16009	16009-Z	16009-2Z	16009-RS	16009-2RS	–	–
	75	16	1	6009	6009-Z	6009-2Z	6009-RS	6009-2RS	6009-N	6009-NR
	85	19	1.1	6209	6209-Z	6209-2Z	6209-RS	6209-2RS	6209-N	6209-NR
	100	25	1.5	6309	6309-Z	6309-2Z	6309-RS	6309-2RS	6309-N	6309-NR
	120	29	2	6409	–	–	–	–	6409-N	6409-NR
50	65	7	0.3	61810	–	–	61810-RS	61810-2RS	–	–
	80	10	0.6	16010	16010-Z	16010-2Z	16010-RS	16010-2RS	–	–
	80	16	1	6010	6010-Z	6010-2Z	6010-RS	6010-2RS	6010-N	6010-NR
	90	20	1.1	6210	6210-Z	6210-2Z	6210-RS	6210-2RS	6210-N	6210-NR
	110	27	2	6310	6310-Z	6310-2Z	6310-RS	6310-2RS	6310-N	6310-NR
	130	31	2.1	6410	–	–	–	–	6410-N	6410-NR
55	72	9	0.3	61811	–	–	61811-RS	61811-2RS	–	–
	90	11	0.6	16011	16011-Z	16011-2Z	16011-RS	16011-2RS	–	–
	90	18	1.1	6011	6011-Z	6011-2Z	6011-RS	6011-2RS	6011-N	6011-NR
	100	21	1.5	6211	6211-Z	6211-2Z	6211-RS	6211-2RS	6211-N	6211-NR
	120	29	2	6311	6311-Z	6311-2Z	6311-RS	6311-2RS	6311-N	6311-NR
	140	33	2.1	6411	–	–	–	–	6411-N	6411-NR
60	78	10	0.3	61812	–	–	61812-RS	61812-2RS	–	–
	95	11	0.6	16012	16012-Z	16012-2Z	16012-RS	16012-2RS	–	–
	95	18	1.1	6012	6012-Z	6012-2Z	6012-RS	6012-2RS	6012-N	6012-NR
	110	22	1.5	6212	6212-Z	6212-2Z	6212-RS	6212-2RS	6212-N	6212-NR
	130	31	2.1	6312	6312-Z	6312-2Z	6312-RS	6312-2RS	6312-N	6312-NR
	150	35	2.1	6412	–	–	–	–	6412-N	6412-NR
65	85	10	0.6	61813	—	—	61813-RS	61813-2RS	—	—
	100	11	0.6	16013	—	—	—	—	—	—
	100	18	1.1	6013	6013-Z	6013-2Z	6013-RS	6013-2RS	6013-N	6013-NR
	120	23	1.5	6213	6213-Z	6213-2Z	6213-RS	6213-2RS	6213-N	6213-NR
	140	33	2.1	6313	6313-Z	6313-2Z	6313-RS	6313-2RS	6313-N	6313-NR
	160	37	2.1	6413	–	–	–	–	6413-N	6413-NR
70	90	10	0.6	61814	–	–	61814-RS	61814-2RS	–	–
	110	13	0.6	16014	–	–	–	–	–	–
	110	20	1.1	6014	6014-Z	6014-2Z	6014-RS	6014-2RS	6014-N	6014-NR
	125	24	1.5	6214	6214-Z	6214-2Z	6214-RS	6214-2RS	6214-N	6214-NR
	150	35	2.1	6314	6314-Z	6314-2Z	6314-RS	6314-2RS	6314-N	6314-NR
	180	42	3	6414	–	–	–	–	–	–

Table 1 (*Continued*)

d	D	B	$r1_s$, $r2_s$ *Min*	Designation[1)]						
				Basic type	Variant					
					Z	2Z	RS	2RS	N	NR
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
75	95	10	0.6	61815	–	–	61815-RS	61815-2RS	–	–
	115	13	0.6	16015	–	–	–	–	–	–
	115	20	1.1	6015	6015-Z	6015-2Z	6015-RS	6015-2RS	6015-N	6015-NR
	130	25	1.5	6215	6215-Z	6215-2Z	6215-RS	6215-2RS	6215-N	6215-NR
	160	37	2.1	6315	6315-Z	6315-2Z	6315-RS	6315-2RS	6315-N	6315-NR
	190	45	3	6415	–	–	–	–	–	–
80	100	10	0.6	61816	–	–	61816-RS	61816-2RS	–	–
	125	14	0.6	16016	–	–	–	–	–	–
	125	22	1.1	6016	6016-Z	6016-2Z	6016-RS	6016-2RS	6016-N	6016-NR
	140	26	2	6216	6216-Z	6216-2Z	6216-RS	6216-2RS	6216-N	6216-NR
	170	39	2.1	6316	6316-Z	6316-2Z	6316-RS	6316-2RS	6316-N	6316-NR
	200	48	3	6416	–	–	–	–	–	–
85	110	13	1	61817	–	–	61817-RS	61817-2RS	–	–
	130	14	0.6	16017	–	–	–	–	–	–
	130	22	1.1	6017	6017-Z	6017-2Z	6017-RS	6017-2RS	6017-N	6017-NR
	150	28	2	6217	6217-Z	6217-2Z	6217-RS	6217-2RS	6217-N	6217-NR
	180	41	3	6317	6317-Z	6317-2Z	6317-RS	6317-2RS	6317-N	6317-NR
	210	52	4	6417	–	–	–	–	–	–
90	115	13	1	61818	–	–	61818-RS	61818-2RS	–	–
	140	16	1	16018	–	–	–	–	–	–
	140	24	1.5	6018	6018-Z	6018-2Z	6018-RS	6018-2RS	6018-N	6018-NR
	160	30	2	6218	6218-Z	6218-2Z	6218-RS	6218-2RS	6218-N	6218-NR
	190	43	3	6318	6318-Z	6318-2Z	6318-RS	6318-2RS	6318-N	6318-NR
	225	54	4	6418	–	–	–	–	–	–
95	120	13	1	61819	–	–	61819-RS	61819-2RS	–	–
	145	16	1	16019	–	–	–	–	–	–
	145	24	1.5	6019	6019-Z	6019-2Z	6019-RS	6019-2RS	6019-N	6019-NR
	170	32	2.1	6219	6219-Z	6219-2Z	6219-RS	6219-2RS	6219-N	6219-NR
	200	45	3	6319	6319-Z	6319-2Z	6319-RS	6319-2RS	6319-N	6319-NR
100	125	13	1	61820	–	–	61820-RS	61820-2RS	–	–
	150	16	1	16020	–	–	–	–	–	–
	150	24	1.5	6020	6020-Z	6020-2Z	6020-RS	6020-2RS	6020-N	6020-NR
	180	34	2.1	6220	6220-Z	6220-2Z	6220-RS	6220-2RS	6220-N	6220-NR
	215	47	3	6320	6320-Z	6320-2Z	–	–	–	–
105	130	13	1	61821	–	–	61821-RS	61821-2RS	–	–
	160	18	1	16021	–	–	–	–	–	–
	160	26	2	6021	6021-Z	6021-2Z	6021-RS	6021-2RS	6021-N	6021-NR
	190	36	2.1	6221	6221-Z	6221-2Z	6221-RS	6221-2RS	6221-N	6221-NR
	225	49	3	6321	6321-Z	6321-2Z	–	–	–	–

Table 1 (*Continued*)

d	D	B	$r1_s$, $r2_s$ *Min*	Designation[1)]						
				Basic type	Variant					
					Z	2Z	RS	2RS	N	NR
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
110	140	16	1	61822	–	–	61822-RS	61822-2RS	–	–
	170	19	1	16022	–	–	–	–	–	–
	170	28	2	6022	6022-Z	6022-2Z	6022-RS	6022-2RS	6022-N	6022-NR
	200	38	2.1	6222	6222-Z	6222-2Z	–	–	6222 N	6222-NR
	240	50	3	6322	6322-Z	6322-2Z	–	–	–	–
120	150	16	1	61824	–	–	61824-RS	61824-2RS	–	–
	180	19	1	16024	–	–	–	–	–	–
	180	28	2	6024	6024-Z	6024-2Z	6024-RS	6024-2RS	6024-N	6024-NR
	215	40	2.1	6224	6224-Z	6224-2Z	–	–	–	–
	260	55	3	6324	–	–	–	–	–	–
130	165	18	1.1	61826	–	–	61826-RS	61826-2RS	–	–
	200	22	1.1	16026	–	–	–	–	–	–
	200	33	2	6026	6026-Z	6026-2Z	6026-RS	6026-2RS	6026-N	6026-NR
	230	40	3	6226	6226-Z	6226-2Z	–	–	–	–
	280	58	4	6326	–	–	–	–	–	–
140	175	18	1.1	61828	–	–	61828-RS	61828-2RS	–	–
	210	22	1.1	16028	–	–	–	–	–	–
	210	33	2	6028	6028-Z	6028-2Z	6028-RS	6028-2RS	–	–
	250	42	3	6228	–	–	–	–	–	–
	300	62	4	6328	–	–	–	–	–	–
150	190	20	1.1	61830	–	–	–	–	–	–
	225	24	1.1	16030	–	–	–	–	–	–
	225	35	2.1	6030	6030-Z	6030-2Z	6030-RS	6030-2RS	–	–
	270	45	3	6230	–	–	–	–	–	–
	320	65	4	6330	–	–	–	–	–	–
160	200	20	1.1	61832	–	–	–	–	–	–
	240	25	1.5	16032	–	–	–	–	–	–
	240	38	2.1	6032	6032-Z	6032-2Z	6032-RS	6032-2RS	–	–
	290	48	3	6232	–	–	–	–	–	–
	340	68	4	6332	–	–	–	–	–	–
170	215	22	1.1	61834	–	–	–	–	–	–
	260	28	1.5	16034	–	–	–	–	–	–
	260	42	2.1	6034	–	–	–	–	–	–
	310	52	4	6234	–	–	–	–	–	–
	360	72	4	6334	–	–	–	–	–	–
180	225	22	1.1	61836	–	–	–	–	–	–
	280	31	2	16036	–	–	–	–	–	–
	280	46	2.1	6036	–	–	–	–	–	–
	320	52	4	6236	–	–	–	–	–	–
	380	75	4	6336	–	–	–	–	–	–

Table 1 (*Continued*)

d	D	B	$r1_s$, $r2_s$ *Min*	Designation[1)]						
				Basic type	Variant					
					Z	2Z	RS	2RS	N	NR
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
190	240	24	1.5	61838	–	–	–	–	–	–
	290	31	2	16038	–	–	–	–	–	–
	290	46	2.1	6038	–	–	–	–	–	–
	340	55	4	6238	–	–	–	–	–	–
	400	78	5	6338	–	–	–	–	–	–
200	250	24	1.5	61840	–	–	–	–	–	–
	310	34	2	16040	–	–	–	–	–	–
	310	51	2.1	6040	–	–	–	–	–	–
	360	58	4	6240	–	–	–	–	–	–
220	270	24	1.5	61844	–	–	–	–	–	–
	340	37	2.1	16044	–	–	–	–	–	–
	340	56	3	6044	–	–	–	–	–	–
	400	65	4	6244	–	–	–	–	–	–
240	300	28	2	61848	–	–	–	–	–	–
	360	37	2.1	16048	–	–	–	–	–	–
	360	56	3	6048	–	–	–	–	–	–
	440	72	4	8248	–	–	–	–	–	–
260	320	28	2	61852	–	–	–	–	–	–
	400	44	3	16052	–	–	–	–	–	–
	400	65	4	6052	–	–	–	–	–	–
	480	80	5	6252	–	–	–	–	–	–
280	350	33	2	61856	–	–	–	–	–	–
	420	44	3	16056	–	–	–	–	–	–
	420	65	4	6056	–	–	–	–	–	–
	500	80	5	6256	–	–	–	–	–	–
300	380	38	2.1	61860	–	–	–	–	–	–
	460	50	4	16060	–	–	–	–	–	–
	460	74	4	6060	–	–	–	–	–	–
	540	85	5	6260	–	–	–	–	–	–
320	400	38	2.1	61864	–	–	–	–	–	–
	480	50	4	16064	–	–	–	–	–	–
	480	74	4	6064	–	–	–	–	–	–
	580	92	5	6264	–	–	–	–	–	–
340	420	38	2.1	61868	–	–	–	–	–	–
	520	57	4	16068	–	–	–	–	–	–
	520	82	5	6068	–	–	–	–	–	–
360	440	38	2.1	61872	–	–	–	–	–	–
	540	57	4	16072	–	–	–	–	–	–
	540	82	5	6072	–	–	–	–	–	–
380	480	46	2.1	61876	–	–	–	–	–	–
	560	57	4	16076	–	–	–	–	–	–
	560	82	5	6076	–	–	–	–	–	–
400	500	46	2.1	61880	–	–	–	–	–	–
	600	90	5	6080	–	–	–	–	–	–

Table 1 (*Concluded*)

d	D	B	$r1_s$, $r2_s$ *Min*	Designation[1)]						
				Basic type	Variant					
					Z	2Z	RS	2RS	N	NR
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
420	520	46	2.1	61884	–	–	–	–	–	–
	620	90	5	6084	–	–	–	–	–	–
440	540	46	2.1	61888	–	–	–	–	–	–
	650	94	6	6088	–	–	–	–	–	–
460	580	56	3	61892	–	–	–	–	–	–
	680	100	6	6092	–	–	–	–	–	–
480	600	56	3	61896	–	–	–	–	–	–
	700	100	6	6096	–	–	–	–	–	–
500	620	56	3	618/500	–	–	–	–	–	–
	720	100	6	60/500	–	–	–	–	–	–
530	650	56	3	618/530	–	–	–	–	–	–
560	680	56	3	618/560	–	–	–	–	–	–
600	730	60	3	618/600	–	–	–	–	–	–
630	780	69	4	618/630	–	–	–	–	–	–
670	820	69	4	618/670	–	–	–	–	–	–
710	870	74	4	618/710	–	–	–	–	–	–
750	920	78	5	618/750	–	–	–	–	–	–
800	980	82	5	618/800	–	–	–	–	–	–
850	1 030	82	5	618/850	–	–	–	–	–	–
900	1 090	85	5	618/900	–	–	–	–	–	–
950	1 150	90	5	618/950	–	–	–	–	–	–
1 000	1 220	100	6	618/1000	–	–	–	–	–	–
1 060	1 280	100	6	618/1060	–	–	–	–	–	–
1 120	1 360	106	6	618/1120	–	–	–	–	–	–
1 180	1 420	106	6	618/1180	–	–	–	–	–	–
1 250	1 500	112	6	618/1250	–	–	–	–	–	–
1 320	1 600	122	6	618/1320	–	–	–	–	–	–
1 400	1 700	132	7.5	618/1400	–	–	–	–	–	–
1 500	1 820	140	7.5	618/1500	–	–	–	–	–	–

[1)] Designation given is informative and may vary for different manufacturers.

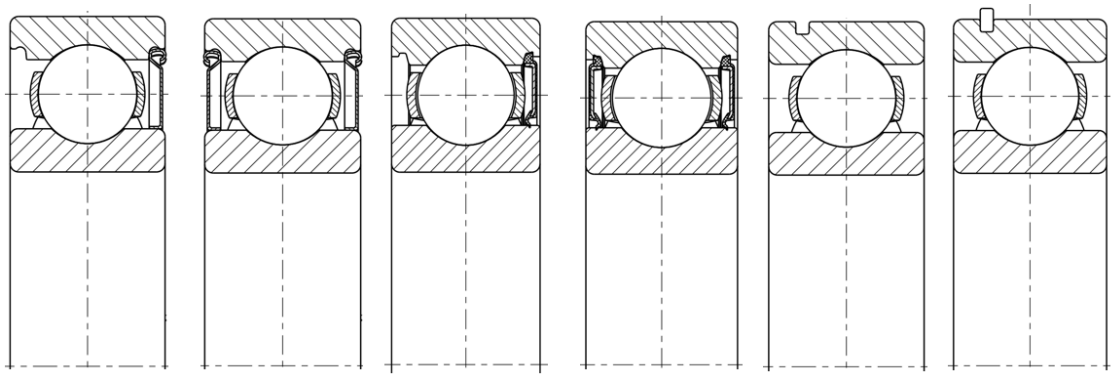
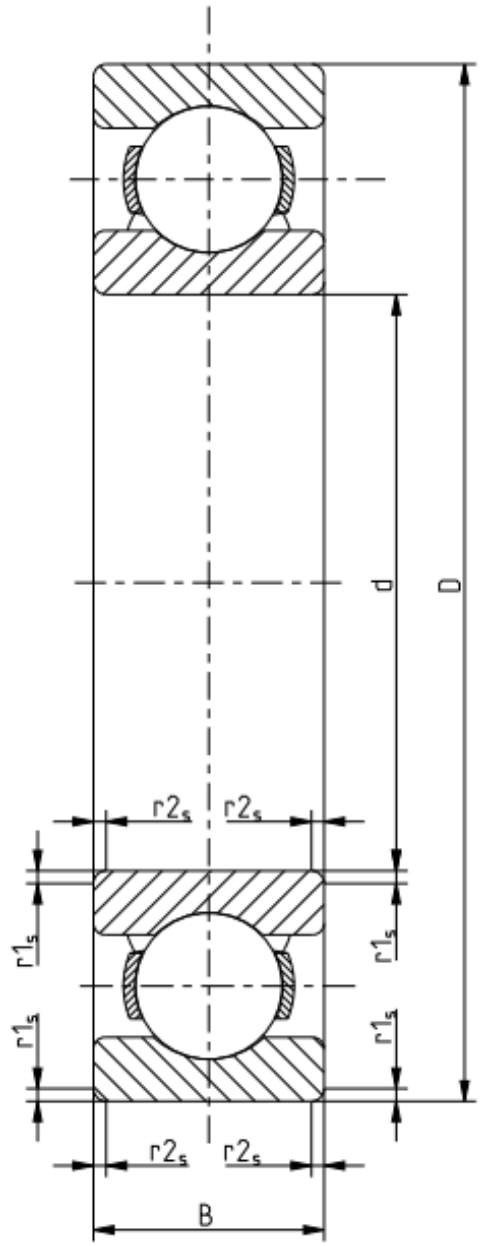


FIG. 1 VARIANTS OF DEEP GROOVE BALL BEARINGS



B Bearing width

D Bearing outside diameter

d Bearing bore diameter

$r1_s$, $r2_s$ Smallest permissible chamfer dimension

Z Bearing with shield on one side

2Z Bearing with shield on both sides

RS Bearing with seal on one side

2RS Bearing with seals on both sides

N Bearing with snap ring groove on surface of outer ring

NR Bearing with snap ring groove on surface of outer ring and associated snap ring.

FIG. 2 TERMS RELATED TO DEEP GROOVE BALL BEARING

5 TOLERANCES AND GEOMETRICAL CHARACTERISTICS

Tolerances and geometrical characteristics of the boundary dimensions shall be as specified in IS 5692 and shall be tabulated based on precision class of bearing from tolerance class '2' to tolerance class 'Normal'.

6 ROLLING ELEMENT

6.1 Requirements for finished steel balls for rolling bearing shall be as specified in IS 2898 (Part 1).

6.2 Requirements for ceramic balls for rolling bearing shall be as specified in IS 2898 (Part 2).

7 MATERIAL OF RACES AND BALLS

7.1 Deep groove ball bearings material has to fulfil the requirements for fatigue strength, wear resistance, hardness, toughness and structural stability. The material used for the races and rolling elements is generally a low-alloy, through hardening chromium steel of high purity. For bearings subjected to considerable shock loads and reversed bending stresses, case hardening steel is also used as per agreement between the supplier and the manufacturer.

7.2 Material of races and balls shall be as specified in IS 17111, IS 5489 or IS 4398 as applicable.

8 CAGE

8.1 Rolling bearing press steel cages are widely used for deep groove ball bearing. Material of Steel cages shall be as specified in IS 4397 or IS 513 (Part 1).

8.2 In some of case deep groove ball bearing cages are also made with brass and polyamide. Material for such cages may be as agreed between supplier and the manufacture.

9 RADIAL INTERNAL CLEARANCE

9.1 Radial internal clearance is arithmetical mean of the radial distances through which one of the rings may be displaced relative to the other, from one eccentric extreme position to the diametrically opposite extreme position, in different angular directions and without being subjected to any external load.

9.2 Radial Internal clearance shall be as specified in IS 5935 (Part 1).

10 SURFACE FINISH

10.1 The outer surface, bore and the sides of rolling bearings shall have the maximum values of surface roughness as given in Table 2 when measured in accordance with IS 3073.

10.2 The surface finish of the functional surfaces shall be as per agreement between the purchaser and the supplier.

11 HARDNESS

11.1 The hardness of the inner rings, outer rings and rolling elements shall be minimum 58 HRC.

11.2 For special heat treatment, hardness requirement may be as agreed between the supplier and the purchaser.

11.3 There shall be no impression of the test cone on the load bearing surface.

Table 2 Permissible maximum Surface Roughness

(*Clause* 10.1)

Nominal Diameter mm		**Permissible Mean Surface Roughness (R_a)** μm								
		Bore			Outside Surface			Sides		
		Tolerance Grade			Tolerance Grade			Tolerance Grade		
(1)		(2)			(3)			(4)		
above	up to	P0, P6	P5	P4	P0, P6	P5	P4	P0, P6	P5	P4
–	120	0.80	0.80	0.32	0.80	0.80	0.32	0.80	0.80	0.32
120	250	1.25	0.80	0.80	0.80	0.80	0.32	1.25	0.80	0.80
250	400	1.25	1.25	–	1.25	1.25	0.80	1.25	1.25	0.80
400	–	1.25	1.25	–	1.25	1.25	–	1.25	1.25	–

The tolerance grade given in Table 2 corresponds to tolerance class given in IS 5692 as given below:

P 0 = tolerance class normal

P 6 = tolerance class 6

P 5 = tolerance class 5

P 4 = tolerance class 4

P 2 = tolerance class 2

12 LOAD RATING

12.1 Basic Dynamic Radial Load Rating

12.1.1 The basic dynamic load rating 'C' is that load of constant magnitude and direction which a sufficiently large number of apparently identical bearings can endure for a basic rating life of one million revolutions.

12.1.2 IS 3824 shall be followed for arriving at basic dynamic radial load rating for deep groove ball bearing.

12.1.3 This standard is not applicable to designs where the rolling elements operate directly on a shaft or housing surface, bearing rings which are integral to housing, for example, planet gear which also acts as bearing raceway unless that surface is equivalent in all respects to the bearing rings quality.

12.2 Basic Static radial load rating

12.2.1 Permanent deformations appear in rolling elements and raceways of rolling bearings under static loads of moderate magnitude and increase gradually with increasing load. Basic static radial load rating is the radial load which corresponds to a calculated contact stress at the center of the most heavily loaded rolling element/raceway contact of 4200 MPa for all radial ball bearings types except self-aligning ball bearings. For these contact stresses, under static load, a total permanent deformation of rolling element and raceway occurs which is approximately 0.0001 of the rolling element diameter.

12.2.2 IS 3823 shall be followed for arriving at basic static radial load rating for deep groove ball bearing.

13 WORKMANSHIP AND DELIVERY REQUIREMENT

13.1 Visual Inspection

The surfaces of the bore, outside diameter, sides and load carrying areas shall be smooth and shall not show any damaged areas.

13.2 Product noise

The running noise of the rolling bearings shall be as agreed to between the supplier and the purchaser.

13.3 Interchangeability

Complete rolling bearings with the same bearing symbols, same boundary dimensions shall be interchangeable with regard to fitting and the functioning.

13.4 Temperatures

The rolling bearing parts during service shall withstand at least 100 °C.

13.4.1 Rolling bearings for service temperatures over 100 °C shall be specially heat treated by manufacturer. The supply of these rolling bearings shall be in accordance with agreement between the purchaser and the supplier.

13.5 Protection Against Corrosion

The type of protection against corrosion shall be decided by the manufacturer depending on the packing material used. Under proper storage conditions, the anti-corrosive treatment shall be effective for at least 12 months in order to ensure a satisfactory functioning of the rolling bearings, unless otherwise required by the purchaser.

13.5.1 For proper storage conditions, the purchaser may consult the manufacturer.

14 PACKING

Rolling bearings treated as in **13.5** shall be packed individually and several pieces may be packed together in suitable containers depending on the size. The packing shall be such as to protect the contents from external influences.

15 MARKING

15.1 Packed containers may be marked with the following:

a) Manufacturer's name or trade-mark;
b) Designation of the bearing;
c) Coded or direct indication of month and year of manufacture; and
d) Quantity.

15.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the standard mark.

16 SAMPLING AND CRITERIA FOR ACCEPTANCE

Shall be as given in Annex A.

ANNEX A

(*Clause* 16)

SAMPLING AND CRITERIA FOR ACCEPTANCE

A-1 SCALE OF SAMPLING

A-1.1 Lot — In any consignment all rolling bearings of the same designation and manufactured under similar conditions of production shall be grouped together to constitute a lot.

A-1.2 Rolling bearings from each lot shall be examined to ascertain its conformity to the requirements of the relevant specification.

A-1.3 Unless otherwise agreed to between the supplier and the purchaser the number of ball bearings to be selected at random shall be in accordance with col 1 and col 2 of Table 3. To ensure randomness, selection methods given in IS 4905 shall be followed.

A-1.4 Number of Tests and Criteria for Conformity

A-1.4.1 The rolling bearings selected according to A-1.3 shall be inspected for dimensions and tolerances, workmanship, surface finish and protection against corrosion. Any bearing failing to meet requirements for any one or more of the above characteristics shall be declared as defective.

A-1.4.1.1 The lot shall be considered conforming to the requirements of the above characteristics, if the number of rolling bearings found defective according to **A-1.3** is less than or equal to the corresponding acceptance number given under col 3 of Table 3.

Table 3 Scale of Sampling and Criteria for Conformity

(*Clauses* A-1.3, A-1.4.1.1 *and* A-1.4.2)

Lot Size	Sampling Size	Acceptance Number	Sub-Sample Size
(1)	(2)	(3)	(4)
Up to 50	5	0	3
51 to 160	8	0	5
161 to 300	13	0	5
301 to 500	20	0	8
501 to 1 000	32	1	13
1 001 and above	60	1	13

A-1.4.2 If the lot is found satisfactory according to A-1.4.1.1, a number of rolling bearings corresponding to sub-sample size given under col 4 of Table 3 shall be selected and subjected to hardness test.

A-1.4.2.1 The lot shall be considered satisfactory to the requirements of the specification if none of the rolling bearings fails to meet the requirement for hardness.

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Bearings Sectional Committee, PGD 13

Organization	*Representative(s)*
Centre for Engineering and Technology (CET), SAIL Ranchi	Shri Virendra Kumar (***Chairman***)
Bajaj auto Ltd, Akurdi, Pune	Shri D. D. Pawar Shri S. D. Gupta (*Alternate*)
Bharat Heavy Electricals Limited, Hyderabad	Shri Manish Agrawal Shri U. Sridhar (*Alternate*)
Bimetal Bearing Limited, Coimbatore	Shri R. S. Mani Shri Raveendra (*Alternate*)
Controllerate of Quality Assurance (Vehicles), DGQA, Ahmednagar	Representative
Defence Metallurgical Research Laboratory, Bengaluru	Shri Satyapal Singh Dr Manish Roy (*Alternate*)
Directorate of Standardization, New Delhi	Representative
Escorts Limited, Faridabad	Representative
GKN Sinter Metals Private Limited, Pune	Shri Dayasagar Mrig
Hindustan Aeronautics Limited, Bengaluru	Shri T. H. Gonsalves Shri Dr C. H. Kannababu (*Alternate*)
ILJIN Bearings Co Limited, Pune	Shri Dharmendra Parmar
Kanpur Metal Products, Kanpur	Shri N. C. Vaish Shri Gaurav Vaish (*Alternate*)
KSPG Automotive (P) Limited, Pune	Shri Rajaram Mane
Maruti Suzuki India Limited, Gurugram	Shri Rakesh Khanger Shri Ramkumar S. (*Alternate*)
National Engineering Industries Limited, Jaipur	Dr Lokesh Agarwal Shri Avinash Sharma (*Alternate*)
NRB Bearings Limited, Thane	Shri Milind Ghan Shri Prakash Banait (*Alternate*)
National Aerospace Laboratories, Bengaluru	Shri Soumendu Jana
Research, Designs & Standards Organization, Lucknow	Shri Vijay Kumar Goel
Schaeffler India Limited, Vadodara	Shri Trilochan Singh Bhatia Shri Biswanath Nandi (*Alternate*)
SKF Bearing India Limited, Pune	Shri Vijay Apte
IPSS, SAIL, New Delhi	Shri K. K. Sinha Shri Gulshan Kumar (*Alternate*)
Tata Motors Limited, Pune	Shri R. R. Kulkarni

Organization	*Representative(s)*
Tata Steel Limited (Bearing Division), Kharagpur	Shri C. Srivastan Shri Pravin Dixit (*Alternate*)
Timken Engineering and Research Pvt Ltd, Bengaluru	Shri Sanjay Koul Shri K. Shreenath Upadhyay (*Alternate*)
BIS Directorate General	Shri Deepak Kumar Jain, Scientist 'F' and Head (PGD) [Representing Director General (*Ex-officio*)]

Member Secretary

Shri Kundan Giri
Scientist 'C' (PGD), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc No.: PGD 13 (15471).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices:		*Telephones*
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002	2323 7617, 2323 3841
Eastern	: 1/14 C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi, KOLKATA 700054	2337 8499, 2337 8561, 2337 8626, 2337 9120
Northern	: Plot No. 4-A, Sector 27-B, Madhya Marg, CHANDIGARH 160019	265 0206, 265 0290
Southern	: C.I.T. Campus, IV Cross Road, CHENNAI 600113	2254 1216, 2254 1442, 2254 2519, 2254 2315
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East), MUMBAI 400093	2832 9295, 2832 7858, 2832 7891, 2832 7892

Branches : AHMEDABAD. BENGALURU. BHOPAL. BHUBANESHWAR. COIMBATORE. DEHRADUN. DURGAPUR. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. JAMMU. JAMSHEDPUR. KOCHI. LUCKNOW. NAGPUR. PARWANOO. PATNA. PUNE. RAIPUR. RAJKOT. VISAKHAPATNAM.

Published by BIS, New Delhi